ASSESSMENT OF RENAL DISEASE IN CATS BY SDMA, CREATININE ASSESSED BY POPULATION REFERENCE INTERVAL AND CREATININE ASSESSED BY REFERENCE CHANGE VALUE

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Background: Symmetric dimethylarginine (SDMA) has recently been advocated as a marker to detect renal disease.

Aims: This prospective study evaluated and compared the diagnosis of renal disease using SDMA, creatinine elevated above population derived reference intervals (RI) with dilute urine and creatinine in relation to an individual’s prior results (RCV).

Results: Over the study period 214 concentrations of SDMA (range: 1 to 115 µg/dL) were determined from 177 cats. Creatinine concentrations (range: 51 to 1009 µmol/L) were available on all occasions; urine specific gravity (USG) was available on 146 occasions (range: 1.008 to 1.063). Percentage change values of creatinine (trend) were available on 150 occasions. SDMA, creatinine, creatinine trend and USG were all available on 108 occasions.

SDMA was within the reported RI (0–14 µg/dL) on 135 occasions. Of these, creatinine by RI and RCV agreed on 104/135 (77%) and 52/89 (58%) occasions respectively. There were 34 discrepancies (25%), of which 29/135 (21%) were likely to have renal disease.

SDMA was elevated (>14 µg/dL) on 79 occasions. Of cats with elevated SDMA, there were 28 discrepancies (35%), of which, 8 (10%) were unlikely to have renal disease.

Conclusions: None of the methods alone were always reliable for detection of renal disease. Whether cats with creatinine elevated by RCV (and dilute urine) but without elevated creatinine (by RI) or elevated SDMA represent early detection of renal disease or false positives needs to be investigated further. Cats in this situation warrant further monitoring.

DIAGNOSIS OF FELINE LEUKAEMIA VIRUS (FeLV) INFECTION IN CLIENT-OWNED DOMESTIC CATS IN AUSTRALIA: WATCH OUT, FALSE-POSITIVES ABOUT!

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Background: FeLV is a challenging infection for veterinarians to diagnose due to a complex feline host-pathogen relationship and occasionally unreliable point-of-care p27 antigen test results.

Aim: To compare the accuracy of three point-of-care FeLV antigen kits (SNAP-FIV/FeLV Combo, Witness-FeLV/FIV and Anigen Rapid-FIV/FeLV), using blood and saliva as diagnostic specimens.

Methods: Blood (n = 563) and saliva (n = 419) were collected from 491 FeLV-uninfected and 72 FeLV-infected cats (45 progressive-infections, 27 regressive-infections). Detection of FeLV provirus by qPCR was used as the diagnostic gold standard.

Results: Sensitivity and specificity using whole blood was 63% and 94% for SNAP-FIV/FeLV Combo, 57% and 98% for Witness-FeLV/FIV, and 57% and 98% for Anigen Rapid-FIV/FeLV, respectively. SNAP had a lower specificity using blood cf. the other two kits (P = 0.004 cf. Witness; P = 0.007 cf. Anigen). False-positive test results occurred with all three kits using blood. Although using any two kits in parallel increased specificity, no combination of test kits completely eliminated false-positive results. FeLV C_T values for progressively FeLV-infected cats (median 22, range 14–37) were significantly lower (i.e. higher proviral load) compared with regressively FeLV-infected cats (median 35, range 29–40) (P < 0.001, Mann-Whitney U test). Progressively FeLV-infected cats were younger (median age 3.4 years) than regressively FeLV-infected cats (median age 7.6 years; P = 0.007). For saliva testing, sensitivity and specificity was 52% and 100%, respectively, for all three test kits.

Conclusions: We recommend confirmatory FeLV provirus PCR testing for any cats testing positive with a point-of-care FeLV antigen kit, as well as for any cat that potentially exposed to FeLV but testing negative with a FeLV antigen kit. Without PCR testing, final assignment of FeLV status cannot be made with confidence. Where PCR testing is unavailable, or rapid confirmation of a positive p27 result is required, repeat p27 testing with a different rapid kit reduces (but doesn’t completely eliminate) the occurrence of false-positive results. The proviral qPCR C_T value may be useful to determine whether the infection is progressive (C_T < 30) or regressive (C_T > 30). Reduced sensitivity of saliva testing compared to blood suggests saliva is unsuitable for screening large populations of cats.
WHAT MAKES A SUPERBUG? ANTIMICROBIAL AND BIOCIDE TOLERANCE IN METHICILLIN-RESISTANT STAPHYLOCOCCUS PSEUDINTERMEDIUS

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Background: Over 250 strains of methicillin-resistant S. pseudintermedius (MRSP) exist in the world, but a recent study found that 30% of Australian clinical veterinary MRSP isolates came from a single strain, called ST71.

Aim: To investigate genotypic and phenotypic features that could explain the dominance of ST71 compared to other strains of MRSP.

Methods: Twenty-six ST71 isolates and 48 MRSP isolates from other strains were examined. Whole genome sequence data was screened for resistance and virulence genes, including qac genes. Qac genes encode efflux pumps that are thought to aid in removal of noxious substances from Staphylococcus cells. Antimicrobial susceptibility was determined by minimum inhibitory concentration (MIC). Tolerance to common veterinary biocides, chlorhexidine and F10, was determined by measuring minimum bacteriocidal concentration (MBC) for each biocide.

Results: ST71 isolates were significantly more likely to house qac genes than other isolates. The median MICs of oxacillin, ciprofloxacin, trimethoprim sulphonamide and amikacin were significantly higher for ST71 isolates than other isolates, while the median MICs of tetracycline and chloramphenicol were significantly lower. The median MBCs of F10 and chlorhexidine were higher for ST71 isolates than others, but not significantly so. Interestingly, there was no significant difference between the MBCs and MICs of qac-positive and qac-negative isolates from any strain.

Conclusions: Increased tolerance to antimicrobials and biocides may facilitate the persistence of ST71 MRSP in veterinary environments. While the presence of qac efflux genes could theoretically explain this persistence, further studies are required to elucidate other mechanisms behind the dominance of ST71.

ASSESSING POINCARÉ PLOT PATTERNS IN CANINE HEART DISEASE

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Background: A Poincaré scatterplot is created by plotting each R-R interval against the subsequent R-R interval. While it is a commonly used tool in the analysis of human heart rate variability, it remains a largely unexploited means of analysis in dogs.

Aim: This pilot study aims to describe patterns of distribution in the Poincaré plots of ambulatory ECG recordings from dogs in different disease status.

Methods: Holter analysis performed in canine patients admitted for full cardiac work up between June 2013 and June 2015 were retrospectively reviewed. Five representative cases were selected of the following disease status: no identified cardiovascular disease (Normal), atrial fibrillation (AF), sick sinus syndrome (SSS) and arrhythmogenic right ventricular cardiomyopathy (ARVC). Poincaré plots were generated using Novacor HolterSoft Ultima Version 2.5.5.

Results: Each disease process presented with a different pattern on the Poincaré scatterplot. Normal patients revealed a “Y” shape with area of lower density points between the “Y” arms and minimal clustering outside the “Y”. AF patients showed clustering over left inferior quadrant with loss of “Y” pattern. In SSS, there was the presence of variable clustered areas, with variable retention of the “Y”. ARVC patients showed complete retention of the “Y” pattern, with no visual difference from Normal patients.

Conclusion: The patterns of the Poincaré scatterplot visually differed between different disease states of Normal, SSS and AF. ARVC appeared indistinct from Normal. These findings require further confirmation in a bigger population of dogs.
COMPARISON OF PROTHROMBIN AND ACTIVATED PARTIAL THROMBOPLASTIN TIME USING A POINT OF CARE COAGULATION ANALYSER WITH A REFERENCE LABORATORY IN DOGS

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Background Point of care (POC) analysers are increasingly used in the veterinary setting. Their sensitivity and specificity are not well studied.

Aims To compare prothrombin (PT) and activated partial thromboplastin time (aPTT) using the point of care analyser SCA2000™ with IDEXX Coag Dx™ cartridges against a reference laboratory (STAGO Start 4®) in healthy and sick dogs presenting to a veterinary hospital.

Methods Samples from prospective blood donors and clinical cases were submitted for PT and aPTT measurements using the SCA2000™ with IDEXX Coag Dx™ cartridges. Values were then compared to a reference laboratory using the STAGO Start 4®. Packed cell volume and total solids were also measured.

Results The sensitivity of the IDEXX Coag Dx™ cartridges in measurement of PT was 91.7% and specificity of PT was 97.8%, based on 57 samples. Sensitivity of aPTT was 100% and specificity was 48.6%, based on 45 samples. Overall agreement between the POC and the reference laboratory was 96.5% for PT and 57.8% for aPTT. Sensitivity of the PT POC cartridges improved from 91.7% to 100%, and specificity of aPTT improved from 48.6% to 55.2% when anaemic or haemoconcentrated samples were excluded.

No relationship could be established between values of the two different analysers and thus trending patients must be performed using the same analyser.

Conclusions The PT result from the POC IDEXX can generally be relied upon. The sensitivity for the aPTT was excellent but the specificity was poor, when compared to a reference laboratory standard.

THE MANAGEMENT OF PERICARDIAL EFFUSION SECONDARY TO RODENTICIDE TOXICITY WITH PERICARDIOCENTESIS AND FRESH FROZEN PLASMA – A CASE SERIES

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Background: The presentation and management of pericardial effusion secondary to rodenticide toxicity has rarely been reported in veterinary medicine. Two isolated case reports have previously described the successful use of pericardiocentesis with different approaches to patient stabilisation. The use of Fresh Frozen Plasma (FFP) in combination with pericardiocentesis has not been reported in these cases.

Aims: This case series aims to compare the severity of pericardial effusions reported in rodenticide toxicity cases presented to Veterinary Specialist Services (VSS) between 1999 and 2016. It will further aim to discuss the outcome of conservative management versus emergency intervention with the use of FFP and pericardiocentesis in patient stabilisation.

Results: Of the 11 cases presented to VSS with pericardial effusions secondary to rodenticide toxicity, 4 were managed with pericardiocentesis, 7 were monitored with echocardiograms and their coagulopathies were treated with Vitamin K therapy. Only 2 of the 4 cases treated with pericardiocentesis received concurrent FFP therapy with full clinical recovery post treatment. The latter 2 patients did not recover from the pericardiocentesis resulting in cardiac arrest and reoccurrence of their pericardial effusion leading to euthanasia. The 7 cases managed with conservative therapy reported a mild pericardial effusion of less than 1 cm on echocardiogram which resolved without pericardiocentesis.

Conclusions: The presence of pericardial effusion in rodenticide toxicity cases while rare can be life threatening. Therefore the use of echocardiogram, emergency pericardiocentesis, and FFP therapy for stabilization may be indicated.
SURVIVAL TIME OF 112 DOGS DIAGNOSED WITH IMMUNE-MEDIATED THROMBOCYTOPENIA

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Background: Canine immune-mediated thrombocytopenia (ITP) is a recognised clinical disorder characterised by the destruction of platelets by anti-platelet antibodies. There is limited published data in veterinary literature describing the survival times of patients diagnosed with ITP.

Aims: This case study aims to describe the average survival times and outcomes of dogs diagnosed with ITP in a specialist setting.

Methods: A retrospective case study of 112 dogs diagnosed with ITP at the Veterinary Specialist Services between December 1999 and March 2016 was undertaken. Data was collated for any patient diagnosed with ITP based on clinical history, blood smears and complete blood count. Survival time is defined as the time from diagnosis of ITP to time of death. Where outcomes were identifiable from clinical records these were used. For those patients where the outcome is not recorded in the clinical record, referring veterinary clinics and clients will be contacted for confirmation of outcomes.

Results: Preliminary analysis of data including outcomes identified from clinical records indicates that following diagnosis with ITP, 14 out of 112 patients (12%) were euthanased or died prior to discharge from hospital and 5 out of 112 (3.5%) are alive at the time of writing, confirmed by a recent visit to the veterinary hospital. The remaining 87 out of 112 identified cases were discharged from hospital following diagnosis with ITP with further results pending ongoing follow up with referring veterinary clinics and patient owners.

TYPE 1 IMMUNE-MEDIATED POLYARTHRITIS AND TEMPORAL RELATIONSHIP TO VACCINATION IN 39 DOGS

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Background: Vaccination has been implicated as a trigger of immune mediated polyarthritis (IMPA) in dogs, however this is yet to be investigated in a case-control study.

Aims: To characterise the epidemiology, presentation and treatment of type 1 IMPA. Secondly, to determine whether there is a potential temporal relationship between vaccination and type 1 IMPA.

Methods: Retrospective study of 39 dogs, with a deduced diagnosis of type 1 IMPA. The last vaccination date prior to the onset of clinical signs associated with IMPA, must have been known. A temporal association between vaccination and polyarthritis was considered, if the most recent vaccination was < 29 days prior to the onset of clinical signs. This cohort was compared with a control population of 78 randomly selected, age matched dogs, from the same referral hospital and study period; with known recent vaccination history, presenting for reasons other than IMPA.

Results: Four of the 39 dogs in the study group had been vaccinated < 29 days prior to the onset of clinical signs compared to five dogs in the control population. No statistical difference was calculated between the two groups (P= 0.542). However, with one patient in the IMPA group, initial onset of polyarthritis was preceded by recent vaccination and relapse of polyarthritis was associated with repeat vaccination within 24hrs of administration.

Conclusion: There does not appear to be a temporal relationship between type 1 IMPA and vaccination, although in some dogs vaccination may be a risk factor.
CLINICAL FEATURES OF CANINE IDIOPATHIC POLYRADICULONEURITIS- A CASE SERIES

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Background: Canine idiopathic polyradiculoneuritis is a common cause of generalized lower motor neuron disease. Currently no definitive diagnostic test exists. Thorough diagnostic work-up to rule out other aetiologies is rarely performed in the clinical setting due to the invasive and/or expensive nature of some tests. Hence a clinical diagnosis is often presumptive and based on neurological examination findings and limited diagnostic assessment.

Aim: To identify clinical features of dogs presumptively diagnosed with idiopathic polyradiculoneuritis including clinical signs, seasonal variation of presentation, diagnostic assessment results, progression of disease, rate of recovery and prognostic factors.

Methods: 125 clinical records between 1996 and 2016 were reviewed.

Results: Non-painful progressive tetraparesis affecting the hind limbs worse than the forelimbs, the presence of proprioceptive responses in conjunction with paresis, poor withdrawal reflexes, normal cranial nerve examination and urinary and faecal continence were the most consistent presenting clinical signs. The results of CBC, blood biochemistry, urinalysis, radiography and CSF analysis were typically within normal reference ranges. Clinical signs progressed between 2-12 days, typically became static for 1-7 days before starting to improve. The rate of recovery varied from 7 days to 4 months. No seasonal variation was identified. Hypoventilation was the only negative prognostic factor identified.

Conclusion: Idiopathic polyradiculoneuritis remains a challenging diagnosis in South-east Queensland due to a lack of a definitive diagnostic test and the overlap of presenting clinical signs with *Ixodes holocylus* toxicity and snake envenomation. It remains a presumptive diagnosis and dogs that do not develop hypoventilation are expected to recover.

IATROGENIC HYPOADRENOCORTICISM IN DOGS BEING TREATED WITH TRILOSTANE FOR HYPERADRENOCORTICISM: INCIDENCE AND RISK FACTORS

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Background: Hypoadrenocorticism in dogs being treated with trilostane for hyperadrenocorticism has been reported in numerous case studies. The incidence and risk factors that contribute to the development of iatrogenic hypoadrenocorticism are unknown.

Aims: To describe the incidence and permanency of iatrogenic hypoadrenocorticism associated with trilostane treatment and to assess potential risk factors.

Methods: A retrospective cohort study using case records for dogs diagnosed with hyperadrenocorticism and treated with trilostane. Records were reviewed to determine whether there was evidence of iatrogenic hypoadrenocorticism. Hypoadrenocorticism was categorised as either temporary or permanent. Potential risk factors including trilostane dose, dosing frequency and bodyweight were assessed.

Results: 183 dogs met the selection criteria. A positive low dose dexamethasone or adrenocorticotroph (ACTH) stimulation test and consistent clinical signs was considered diagnostic for hyperadrenocorticism (165/183 dogs). The remaining 18 dogs were considered equivocal and treated based on clinical suspicion. Hypoadrenocorticism affected an estimated 19% of dogs by 2 years after starting trilostane with about two-thirds of these temporarily affected. Hazard of hypoadrenocorticism increased progressively for 2 years following initiation of trilostane before declining rapidly. Hazard was higher in heavier dogs even after accounting for daily dose rate and frequency. Daily dose rate and frequency of trilostane administration were not associated with hazard of hypoadrenocorticism but effect estimates were imprecise.

Conclusion: Iatrogenic hypoadrenocorticism associated with trilostane treatment may be more common than previously thought. Hazard of hypoadrenocorticism increases progressively for the first 2 years of treatment and about one-fifth of dogs become affected by this time. About two-thirds of these are temporarily affected.
BIOLOGICAL VARIATION OF SPECIFIC FELINE PANCREATIC LIPASE IN CLINICALLY HEALTHY CATS

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Background: Comparison of a specific feline pancreatic lipase (Spec fPL) result against a reference interval is the currently utilised method for determining whether an elevation is likely clinically significant. However, to date no biological variation data on Spec fPL in cats has been reported to confirm the appropriateness of this method.

Aims: To determine biological variation, indices of individuality, and reference change values for Spec fPL in order to evaluate the utility of a population-based reference interval for interpretation of Spec fPL.

Methods: Thirteen cats were enrolled in the study. For inclusion, all cats were considered to be healthy based on routine laboratory analysis, Spec fPL and abdominal ultrasonography. Four blood samples were collected at two-weekly intervals. At study conclusion, Spec fPL concentrations were measured on all serum samples using commercially available assays.

Results: Intra-individual variation for Spec fPL was calculated at 18.2%; inter-individual variation at 49.3% and CV at 8.7%. Index of individuality for Spec fPL was 2.5, and the 2-sided reference change value was 55.8%.

Conclusions: Based on a high index of individuality, use of a population-based reference interval for Spec fPL when screening for pancreatitis will likely underestimate the number of cats with clinically significant elevations. Instead, use of subject-based reference intervals is likely a more sensitive measure for detection of pancreatitis in cats. A 56% elevation in an individual cat's Spec fPL result, compared to its baseline value recorded during health, can be regarded as suggestive of a pathological change rather than intra-individual biological variation.

RETROSPECTIVE STUDY OF 97 DOGS WITH BILIARY MUCOCOELES

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Background: Biliary mucocoeles (BM) are common incidental findings during abdominal ultrasound. Cholecystectomy is associated with high perioperative mortality and postoperative complication. There is limited veterinary literature on efficacy of non-surgical treatment for BM.

Aims: To investigate survival and complication rates of patients with BM that were treated non-surgically compared to surgical treatment.

Methods: Veterinary Specialist Services records of patients with BM were categorized by clinical or non-clinical nature of BM, treatment and outcome.

Results: 97 dogs included. 27 (27.8%) patients presented with clinical illness attributable to BM at diagnosis. 70 (72.2%) patients had BM diagnosed that was not attributable to clinical illness. 15 (15.5%) of patients were treated surgically due to clinical disease. One patient (1%) was euthanised due to post-operative complications. Two (2.1%) patients were euthanised at diagnosis. 80 (82.4%) patients were managed conservatively, all of which were discharged. Two patients (2.1%) are known to have resolution of their BM. At time of record collection, one patient (1.0%) is known to be alive. 16 (16.5%) patients are known to be deceased. One patient (1%) was euthanised due to post-operative complications. 15 (15.5%) patients died or were euthanised due to unrelated illness. Zero (0%) patients treated non-surgically returned for surgical treatment or BM related illness.

Conclusion: The majority of patients with BM do not have attributable illness at time of diagnosis. Patients treated non-surgically have a high rate of discharge rate from hospital. No patient treated non-surgically is recorded to have returned for BM related illness.